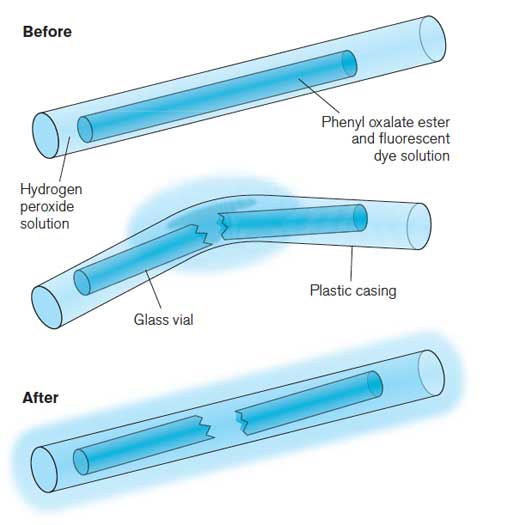
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**Enzyme Demos**

Mrs. Krouse, PreAP Biology, 2015-2016

**Glowstick Demo Information:**

-When the glowstick is snapped, the “inner chemical” inside the glass vial mixes with the hydrogen peroxide in the outer casing… this results in a chemical reaction that produces a “changed inner chemical”, water, and oxygen gas… the dye solution uses the energy released in the reaction to glow

-Inner Chemical + Hydrogen Peroxide (H2O2) + Dye 🡪 Changed Inner Chemical + H2O + O2 (oxygen gas) + Glowing Dye

-This is NOT a reaction involving an enzyme because ALL the molecules are changed in the reaction (enzymes do NOT get changed in a reaction)… so we can’t identify the enzyme, substrate, and products of the reaction

-However, ALL reactions (whether assisted by an enzyme or not), tend to have lower rates of reaction (i.e. they are slower) at lower temperatures. This is because the molecules involved in the reaction move more slowly so they do not collide and react to create products as frequently at lower temperatures.

**Potato and Hydrogen Peroxide Demo Information:**

- When potatoes and hydrogen peroxide are mixed, an enzyme inside the potato called catalase breaks down the hydrogen peroxide into water and oxygen gas. Potatoes have this enzyme because hydrogen peroxide is toxic to them in high concentrations, so they need to be able to break it down into non-harmful substances (i.e. water and oxygen gas).

-Hydrogen Peroxide + Catalase 🡪 H2O + O2 (oxygen gas) + Catalase

|  |  |
| --- | --- |
| **Beaker 1** | **Beaker 2** |
| 3 small cubes of potato  60 mL of 3% hydrogen peroxide | 3 small cubes of potato  15 mL of 3% hydrogen peroxide, 45 mL of water |

**Glowstick Demo Questions:**

1. What reaction is occurring here? What are the enzyme, substrate, and products of the reaction?
2. What is the difference between the two trials that were conducted?
3. How will we compare the rate of reaction between the two trials?
4. How did the rate of reactions compare between the two trials? Explain your answer by describing the typical effect of reduced temperature on the rate of reaction.

**Potato and Hydrogen Peroxide Demo Questions:**

1. What reaction is occurring here? What are the enzyme, substrate, and products of the reaction?
2. What is the difference between the two trials that were conducted?
3. How will we compare the rate of reaction between the two trials?
4. How did the rate of reactions compare between the two trials? Explain your answer by describing the typical effect of increased substrate concentration on the rate of reaction.